

**A REASSESSMENT OF THE AUSTRALIAN SPECIES OF *MENEPHILUS* MULSANT
(COLEOPTERA: TENEBRIONIDAE) WITH DESCRIPTIONS OF TWO NEW GENERA AND A
LARVA AND PUPA**

E. G. MATTHEWS & J. T. DOYEN

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Among the Australian species previously assembled under the generic name *Menephilus* Mulsant are three natural genera. One is *Tetragonomenes* Chevrolat (Coelometopinae) with five named Australian species not revised here. Two are new and described as *Kaszaba* gen. nov. (Coelometopinae) and *Bassianus* gen. nov. (Tenebrioninae), each with four named species. New combinations are: *Tetragonomenes aeneus* (Carter), *T. azuripennis* (Carter) and *T. ruficornis* (Champion); *Kaszaba coerulescens* (Haag-Rutenberg), *K. corvina* (Erichson), *K. laeta* (Carter) and *K. pulchra* (Carter); *Bassianus colydioides* (Erichson), *B. humilis* (Erichson), *B. rectibasis* (Carter) and *B. sydneyanus* (Blackburn). *B. armstrongi* (Carter) is newly synonymised with *colydioides* (Erichson). The affinities of the new genera are discussed and their species keyed and briefly reviewed. The larva of *Bassianus rectibasis* and the pupa of *B. sydneyanus* are described and compared with larvae of related genera and the tribe Heleini.

E.G. Matthews, South Australian Museum, North Terrace, Adelaide, South Australia, 5000 & J.T. Doyen, Division of Entomology, University of California, Berkeley, California 94720. Manuscript received 21 March 1988.

Confusion has attended the use of the generic name *Menephilus* Mulsant in Australia from its first application by Macleay (1872) to his new *parvulus* (= *colydioides* Erichson) and to *nigerrimus* Boisduval (a *nomen dubium* possibly in the genus *Zophophilus* Fairmaire). Altogether, species belonging to five different genera have at one time or another been described in, or assigned to, *Menephilus* in Australia. None of these are currently considered to be congeneric with the European type species *M. cylindricus* Herbst. However, *Zophophilus* (= *Teremenes* Carter), with four Australian species, is very close to *Menephilus* (Doyen *et al.* in press).

Carter's (1926) checklist of the Australian Tenebrionidae still contained elements of three different genera in '*Menephilus*' and it is our purpose in the present paper to sort out the species included and assign them to their correct genus. Two of the latter are new and are dealt with below. The third is *Tetragonomenes* Chevrolat (1878), subsequently redescribed as *Obriomaia* Gebien (1927) [see Kaszab (1983) for synonymy].

It is not our intention to revise the species of *Tetragonomenes* here and we have not examined the relevant types. It is clear from descriptions and identified material, however, that the following Australian specific names belong in this genus: *aeneus* Carter (1905), comb. nov., *azuripennis* Carter (1914), comb. nov., *intercoxalis* Kulzer (1951), *ocularis* Kulzer (1951), and *ruficornis* Champion (1894), comb. nov. It is unlikely that all of these names are valid.

Tetragonomenes is an Indo-Malayan genus of Coelometopinae and like all Australian members of this subfamily it represents the 'younger northern element' of the Australian fauna [*sensu* Mackerras (1970)]. Even so, it has penetrated the continent along the east coast as far south as Tasmania and along the south coast to Western Australia.

The other two elements in '*Menephilus*' include one other coelometopine, here named *Kaszaba* gen. nov., which has likewise reached Tasmania but which is not known west of central Victoria. It occurs in northern Australia but as yet we have not seen any Papuan or Indo-Malayan species which can be assigned to it. The third element is unrelated to the previous two and belongs to the Tenebrioninae, Tenebrionini. In Australia the native Tenebrionini are a Bassian group concentrated in the south-east but extending, with diminishing representation, as far north as New Guinea. We have named the tenebrionine genus *Bassianus* gen. nov. to highlight its southern origins.

That such disparate elements could hitherto have been confused under a single generic name reflects external morphological convergence, probably due to a similarity of habitat. From scant label data and our own observations, it appears that *Tetragonomenes*, *Kaszaba*, and *Bassianus* are all found under the bark of fallen trees and rotten logs in forests. In some cases members of different genera share exactly the same label data, indicating that they were found together.

We studied the original type material of all the 11 specific names in *Kaszaba* and *Bassianus* and

material from most major Australian collections. The following acronyms are used to identify the collections consulted:

- AMSA Australian Museum, Sydney
 ANIC Australian National Insect Collection, Canberra
 BMNH British Museum (Natural History), London
 EMUC Essig Museum, University of California, Berkeley
 HCOE Hope Entomological Collections, University Museum, Oxford
 MNHB Museum für Naturkunde der Humboldt-Universität, Berlin
 MVMA Museum of Victoria, Melbourne
 QMBA Queensland Museum, Brisbane
 SAMA South Australian Museum, Adelaide
 UQBA Department of Entomology, University of Queensland, Brisbane
 ZSSM Zoologische Staatssammlung, Munich.

SYSTEMATICS

Kaszaba gen. nov.

Type-species: *Tenebrio corvinus* Erichson, (1842).

Description of adult

General appearance: Oblong. Piceous, usually with metallic reflections. Total length 7–15 mm.

Head: Epistoma with anterior edge straight or feebly concave, its suture complete, indistinct, not impressed, arcuate. Eyes small to moderate, globose, separated by a distance equal to 2.5–5 eye widths. Canthus feebly developed. Head surface finely, densely punctate, glabrous. Bridge of tentorium arcuate. Labrum transverse. Mandibles bidentate apically. Lacinia with uncus. Maxillary palpi with terminal segment subtriangular or truncate-oval. Mentum trapezoidal, with a very prominent, rounded median longitudinal ridge. Antennae short, not reaching base of prothorax, segments gradually enlarging apically, with scattered tenebrioid organs (complex sensoria) on apical segments.

Prothorax: Subquadrate in outline, lateral edges feebly sinuate. Anterior angles broadly rounded, not prominent. Posterior angles subquadrate. Base feebly produced medially. Pronotum margined except along middle of anterior edge; disc convex, more so anteriorly, finely punctate, glabrous. Prosternum without median keel, process only feebly expanded and rounded apically, not prolonged. Coxal cavities closed both externally and internally.

Pterothorax: Humeri wider than base of prothorax. Elytra with nine deep striae and scutellary striole; striae punctures deep, crenulating

edges of intervals, which are convex, smooth, extremely finely punctate and glabrous. Epipleura narrow, terminating opposite penultimate sternite where they bear a deep groove to receive edges of latter. Mesosternum shallowly excavated, finely and densely setose. Mesepimera reaching mid-coxal cavities. Wings without subcubital fleck, with normal tenebrioid venation (see Matthews 1986).

Legs: Front femora of average proportions. Tibiae gradually expanded apically, not dentate, apical spurs very short. Tarsal segments, except apical, short, penultimate cupuliform, with long dense setae beneath, including claw segment. Claws unmodified.

Abdomen: Intercostal process of basal sternite triangular. Upper edge of apical sternite grooved to receive elytra. Defensive reservoirs very large and reinforced by helical thickenings. Female genital tract of advanced coelometopine type (Tschinkel & Doyen 1980), without bursa and with globose spermatheca at apex of long spermathecal tube (Fig. 3). Ovipositor very long, of coelometopine type with transverse paraprocts (Fig. 3). Aedeagus with parameres slender and tapering, largely fused, comprising $2/3$ of total aedeagal length, enveloping median lobe, without setae.

Sexual dimorphism: Evident only on front femur, which in the male bears a small, linear lenticular tomentose patch in the middle of inside face.

Remarks

Kaszaba clearly belongs to the Coelometopinae, especially in the structure of the female genital tube (Fig. 3), which is of the typical advanced coelometopine type (Tschinkel & Doyen 1980), in the enlarged, annulate defensive reservoirs, and the transverse paraprocts of the ovipositor. Externally coelometopines are difficult to distinguish from certain Tenebrioninae, especially the Tenebrionini. About the only consistent character is the presence of complex antennal sensoria in the former and not in the latter.

Within the Coelometopinae, *Kaszaba* is recognised by a combination of the incomplete elytral epipleura, the feeble pro-mesosternal locking mechanism, rounded anterior pronotal angles, cupuliform penultimate tarsal segments, and fully developed hind wings with normal tenebrioid venation (not the 'coelometopine venation', see Matthews 1986). It comes closest to *Espiles* Pascoe in diagnostic characters but has an elongate, *Tenebrio*-like form and uniform coloration. Superficially *Kaszaba* most closely resembles *Tetragonomenes*, but the latter does not have cupuliform tarsal segments, the lateral pronotal margin is irregularly dentate, the pronotal disc is more convex and coarsely punctate, the median keel of the mentum is sharp (not rounded) and less

prominent, and in the male there is no setal patch on the inner front femoral surface.

The species of *Kaszaba* are closely related and can be separated with difficulty only on the basis of superficial features of colour, proportions and size. No genital differences could be found.

The genus is named in honour of the late Dr Zoltán Kaszab in recognition of his important contribution to knowledge of Pacific Tenebrionidae.

KEY TO THE SPECIES OF *KASZABA*

- 1. — Without or with only the faintest trace of metallic reflections; pronotum subquadrate, little broader anteriorly; eyes small, separated by about four times their width when seen from above (Fig. 28); total length 7–11 mm. Victoria to Queensland *coerulescens* (Haag-Rutenberg)
- With distinct blue, green or purple reflections; other characters not present in same combination 2
- 2(1) — Pronotum subquadrate, length to width ratio about 1 : 1.2, little broader anteriorly; eyes small, separated by about five times their width (Fig. 29); total length 10–15 mm. Tasmania to southern Queensland *corvina* (Erichson)
- Pronotum transverse, about 1.4 times as wide as long; eyes larger; total length not over 13 mm 3
- 3(2) — Total length 10–13 mm; pronotum slightly narrowing anteriorly; eyes separated by about four times their width (Fig. 30). Cairns district, Queensland *laeta* (Carter)
- Total length 8–10 mm; pronotum slightly widened anteriorly; eyes larger, separated by 2.5–3 times their width (Figs 31, 32). Northern Queensland and Northern Territory *pulchra* (Carter)

Kaszaba coerulescens (Haag-Rutenberg) comb. nov.
(Figs. 1, 3, 5, 28)

Menephilus coerulescens Haag-Rutenberg 1878: 100; Haag-Rutenberg 1879: 122; Carter 1914: 52, 53; Carter 1926: 146.

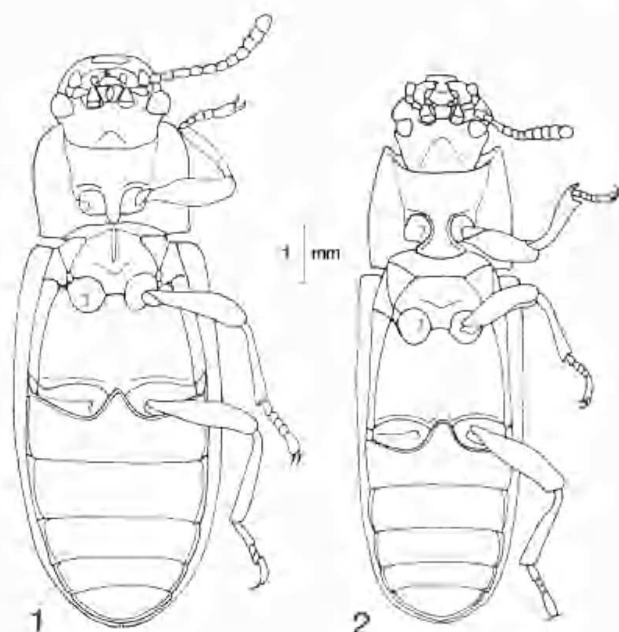
Types

The provenance of the species is given by Haag-Rutenberg (1878) as Cape York and New South Wales. The type series in ZSSM consists of six specimens, all the same species. The specimen bearing Haag's identification label '*coerulescens m.*', a female, is designated lectotype. It also bears the labels: 'cotype *Meneph. coerulescens* H.R.' and 'N. Holl. Dollé'. The other five specimens are

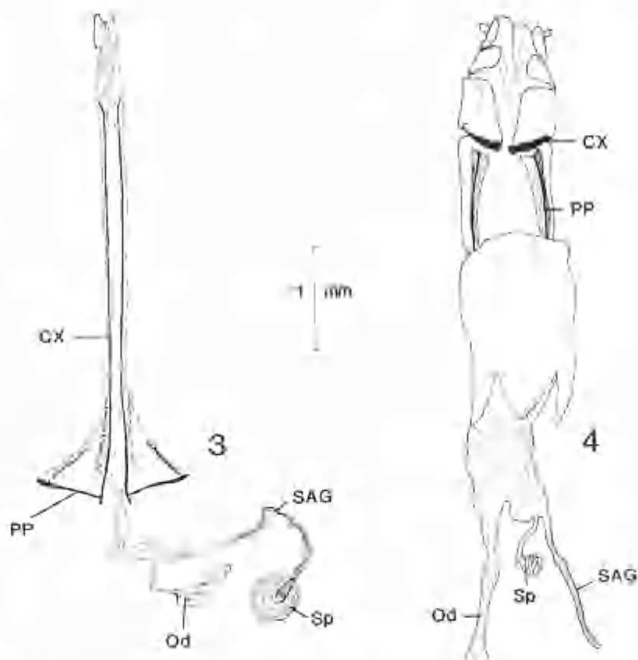
designated paralectotypes and are labelled as follows: 'Austr. bor. Godefr.' (1♂); 'N.S. Wales Baulng' (2♂♂); 'N. Holl. Parz.' (1♀); 'Cp. York Telfing' (1♀).

Distribution

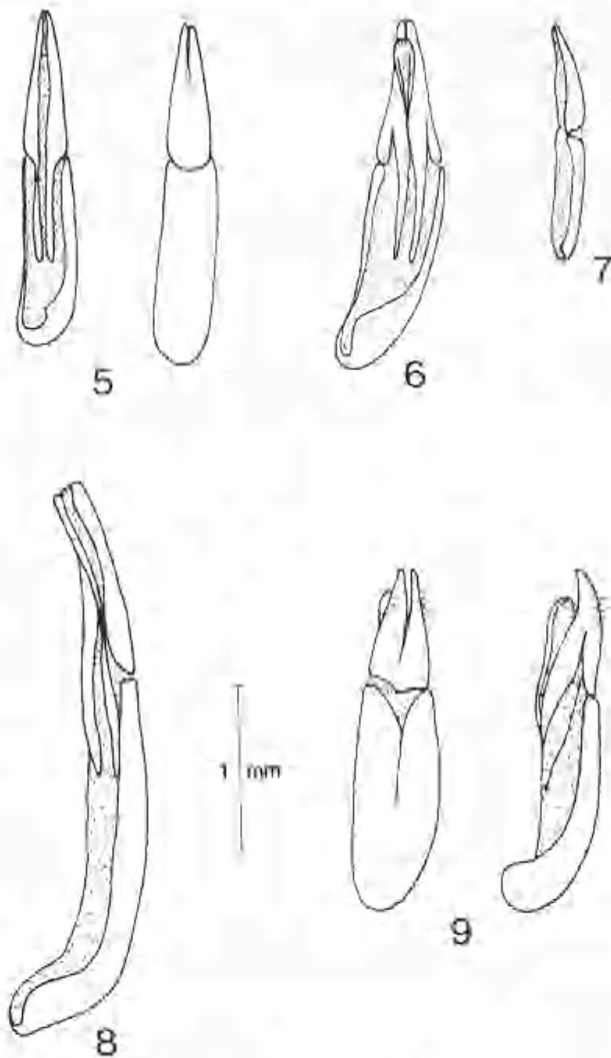
Coastal Victoria from the Melbourne area eastward, New South Wales mostly east of the Great



FIGURES 1 & 2. 1. *Kaszaba coerulescens*, venter. 2. *Bassianus colydioides*, venter.



FIGURES 3 & 4. Female genital apparatus. 3. *Kaszaba coerulescens*. 4. *Bassianus sydneyanus*. CX — baculus of coxite; PP — Baculus of paraproct; Od — oviduct; SAG — spermathecal accessory gland; Sp — spermatheca.



FIGURES 5-9. 5, aedeagus of *Kaszaba coerulescens*, ventral (left) and dorsal (right). Aedeagi of *Bassianus*: 6, *B. sydneyanus*. 7, *B. colydioides*. 8, *B. humilis*. 9, *B. rectibasis*, dorsal (left) and lateral view (right).

Dividing Range, south-eastern Queensland, and possibly isolated populations known from central Queensland at Eungella, west of Mackay, and the Atherton Tableland. The single specimen in the type series labelled Cape York is the only one known from that area.

Remarks

This is by far the most frequently collected species in the genus and has always gone correctly under the name *coerulescens* in collections despite that it is not bluish as Haag implied in the name and stressed in the description and remarks. It shows only a very faint trace of blue colour when wetted. In all other respects the type specimens agree with the original description.

Material examined

Two hundred and eighteen specimens. Victoria: Bacchus Marsh district; Beaconsfield; five miles N

Cann R., swamp forest; Chiltern; Gippsland; Healesville; Lakes Entrance; Melbourne; Mitchell Gorge; Narracan; Noble Park; Ringwood; Traralgon; Tyers; Victorian Alps; Warburton. Australian Capital Territory: Brindabella Range, Old Mill Rd, 2 775'. New South Wales: Bathurst; Black Heath; Blue Mts; Brown Mt; Bundjalong N.P., Black Rocks; Deep Creek; Dorrigo; Duggan's Gully, Upper Chichester; Eccleston; Forest Reefs; Galston; Gibraltar Range N.P.; Gosford; Hastings River; Jenolan S.F.; Lilyvale; McArthur's Clearing nr. Kempsey; 4-8 km SW Lake Cathie; Lowden Forest Park; Mittagong; 15 km NW Moruya; Mt Kaputar N.P., Dawsons Spr., 3 500-4 500'; Moss Vale; National Park; Penrose S.F.; Poverty Point 20 km SE Tenterfield; Richmond River; Seven Mile Beach; Sydney; Tweed River; Ulong; East Dorrigo; Upper William River; Uralla, 1 mile W of river crossing; Walcha; Wentworth Falls; Yetholm. Queensland: Acacia Ridge; Bald Mt area via Emu Vale, 3-4 000'; Blackall Range; Broken River; Eungella; Bunya Mts.; Cunningham's Gap N.P., 4 miles W Cunningham's Gap; Dunwich, N. Stradbroke I.; Eukey; Gatton; Kroombit Tops, 45 km SSW Calliope; 12 km N Kuranda; MacPherson's Range; Mapleton; Mt Tamborine; 18 mi N Quinalow; Stanthorpe; Sugarloaf. Logs, open forest, rainforest, dry sclerophyll. All months of the year. AMSA, ANIC, EMUC, MVMA, QMBA, SAMA, UQBA.

Kaszaba corvina (Erichson), comb. nov. (Fig. 29)

Tenebrio corvinus Erichson, 1842: 175.

Menephilus corvinus, Champion 1894: 390; Carter 1914: 52; Carter 1926: 146.

Tenebrio cyanipennis Hope 1843: 360; Hope 1845: III; Champion 1894: 390 (syn).

Types

Of *corvina*: Van Diemen's Land. A single female in MNHB bears the labels 'corvinus Er.' and 'Terr. van Diem. Schayer', and the number 45958. It is here designated lectotype. Of *cyanipennis*: a single male, somewhat damaged, bearing the labels 'TYPE HOPE Proc. Ent. Soc. 1842 p. 79 Coll. Hope Oxon' and 'cyanipennis Hope N. Holl, Type Coll. 1102' (HCOE). The citation and date appearing on the first label is the one that is frequently quoted in catalogues but it is incorrect, since those Proceedings of the Entomological Society were not published until 1843.

Distribution

Tasmania, mountainous areas of Victoria, New South Wales, and extreme southern Queensland. The species was recorded from South Australia by

Champion (1894) and Carter (1914, 1926), apparently on the basis of the title of Hope's 1845 paper redescribing *cyanipennis*. However, in the latter work Hope described many species which were clearly not from Adelaide and there is no indication of where *cyanipennis* was collected. We have not seen this species from west of Macedon, Victoria.

Material examined

Twenty-four specimens. Tasmania: Brown's River; Hobart; Launceston; Mole Creek; Swansea. Victoria: Alps; Buffalo River Preserve; Macedon; Melbourne District. Australian Capital Territory: Brindabella Rge., Piccadilly Circus, 3 650'. New South Wales: Blue Mountains; Brown Mountain; Ebor; 30 km S Glen Innes; Tooloom Plateau via Urbenville. Queensland: Stanthorpe, Jan, Feb, Apr, Oct., Nov. AMSA, EMUC, MVMA, QMBA, SAMA, UQBA.

Kaszaba laeta (Carter) comb. nov. (Fig. 30)

Menephilus laetus Carter 1914: 69; Carter 1926: 146.

Types

Kuranda, North Queensland, MVMA. There are two specimens in the type series, a male and a female of the same species, both labelled 'Kuranda Dodd', and bearing the numbers T-4092 and T-4091 respectively on separate red labels. The female also bears the label in Carter's hand '*Menephilus laetus* Carter 10-11-12'. The female, No. 4091 (identified as a male) is in better condition and is hereby designated lectotype, and the male, allotype.

Distribution

Known only from the Atherton Tableland in north Queensland.

Material examined

Eight specimens. Queensland: Cairns District; Mareeba; Ravenshoe. July (3). MVMA, QMBA, SAMA.

Kaszaba pulchra (Carter), comb. nov. (Figs 31, 32)

Menephilus pulcher Carter 1924: 36; Carter 1926: 146.

Type

North Queensland; Deeral. J.F. Illingworth, scrub. AMSA K67235. A single female with the abdomen missing, designated holotype by Carter (1924). Deeral (17°13'S, 145°55'E) is a station on the railway which parallels Highway One, approx-

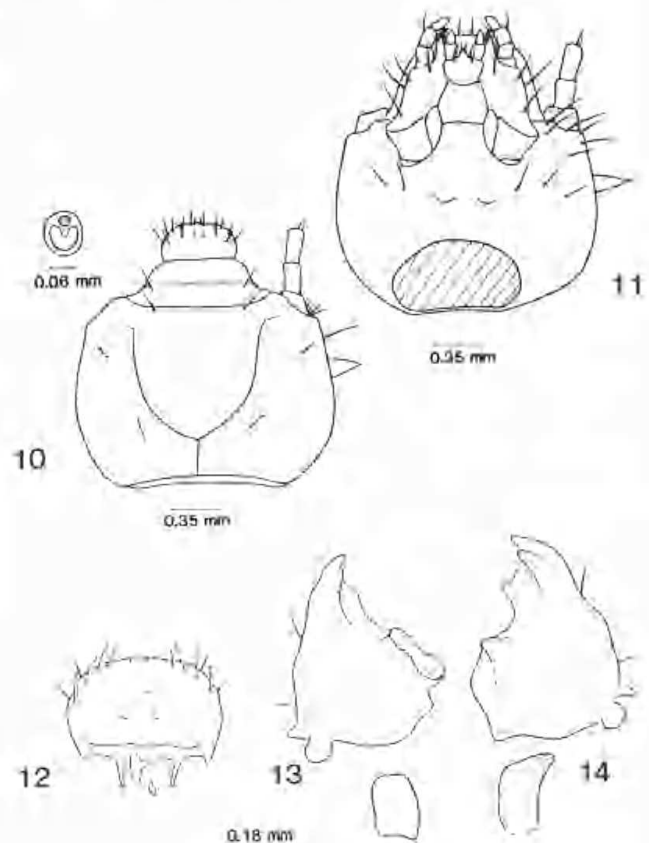
imately halfway between Gordonvale and Babinda.

Distribution

Along the coast and on offshore islands, from Bowen (Port Denison) to Cairns, north Queensland and the northern end of the Northern Territory.

Remarks

Queensland specimens have the elytra green with the lateral three or four intervals golden, whereas the three Northern Territory specimens known have uniformly purple elytra. The latter also have slightly smaller eyes in dorsal view (Fig. 32). Material is insufficient for us to decide whether the Northern Territory form is a separate species.



FIGURES 10-14. *Bassianus rectibasis*, larva. 10, head, dorsal aspect, mandibles and left antenna removed. Dashed line indicates eye spots. Inset shows apical view of 2nd antennal segment. 11, same, ventral aspect. 12, labrum (epipharynx), ental aspect. 13, 14, right and left mandibles, ventral aspect, with normal view of molar surfaces below.

Material examined

Thirteen specimens. Queensland: Bowen; Cairns; Magnetic Island; Mary Creek; Palm Island; Port Denison. Northern Territory: Groote Eylandt; South Alligator Inn, May (1). AMSA, EMUC, SAMA, UQBA.

Bassianus gen. nov.

Type-species: *Tenebrio colydioides* Erichson, 1842.

Description of adult

General appearance: Oblong. Entirely piceous. Total length 6–13 mm.

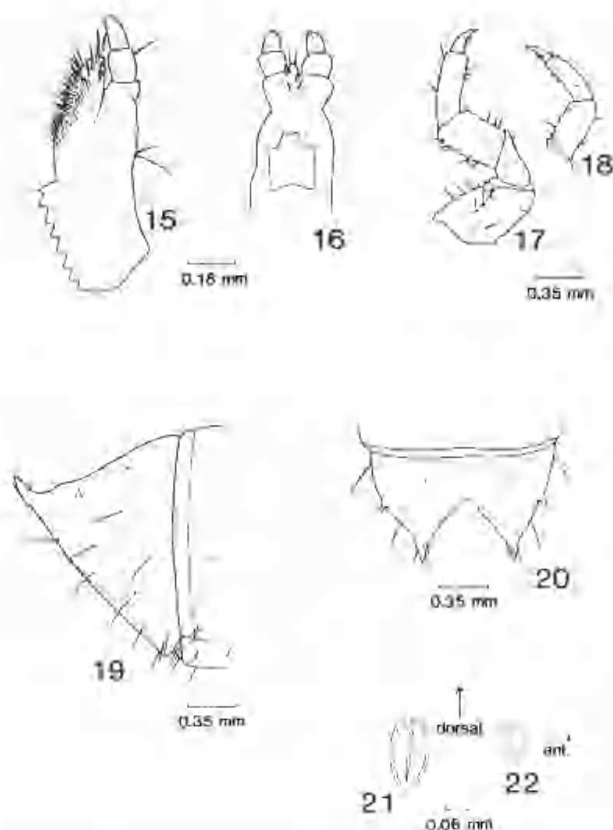
Head: Epistoma with anterior edge shallowly concave, suture ill-defined, arcuate. Eyes small, inwardly with a straight edge, separated by distance equal to 3.5–5 eye widths, canthus well developed. Head surface densely punctate, glabrous. Bridge of tentorium flat, straight. Labrum transverse. Mandibles bidentate apically. Lacinia with uncus. Maxillary palpi with terminal segment oval or subtriangular. Mentum trapezoidal, without median keel or with feeble one. Antennae short, not reaching base of prothorax, apical four or five segments somewhat widened, without complex sensoria.

Prothorax: Subquadrate to trapezoidal in outline. Anterior angles strongly projecting forward. Posterior angles subquadrate or subacute. Base sinuate or straight. Pronotum finely margined except along middle of anterior edge, disc evenly convex, finely to moderate punctate, glabrous. Prosternum without median keel, process strongly closed externally, open internally.

Pterothorax: Humeri little wider than base of prothorax, more or less grooved basally to receive prothorax. Elytra with 9 shallow, coarsely punctate striae and scutellary striole. Intervals feebly convex, impunctate and glabrous. Epipleura narrow, complete to apices. Mesosternum strongly stepped to receive prosternum. Mesepimera reaching mid-coxal cavities. Metendosternite Y-shaped, without laminae. Wings with subcubital fleck, sometimes faint.

Legs: Front femora relatively massive. Tibiae gradually expanded and with dense setae apically, not dentate, apical spurs very short. Tarsal segments, except apical, short, not cupuliform, with long dense setae beneath all except claw segment, which has only sparse setae, claws unmodified.

Abdomen: Intercoxal process of basal sternite U-shaped or rounded-triangular, upper edge of apical sternite not grooved. Defensive reservoirs small, without annuli. Female genital tract of tenebrionine type (Tschinkel & Doyen 1980), without bursa, with strongly coiled spermatheca at end of short branch diverging from non-glandular basal portion of the accessory gland (Fig. 4). Ovipositor short, of tenebrionine type with longitudinal paraprocts (Fig. 4). Aedeagus with parameres basally fused, slender and tapering, setose, comprising nearly half of total aedeagal length, enveloping median lobe. Median lobe with two reinforcing rods (Figs 6–9).



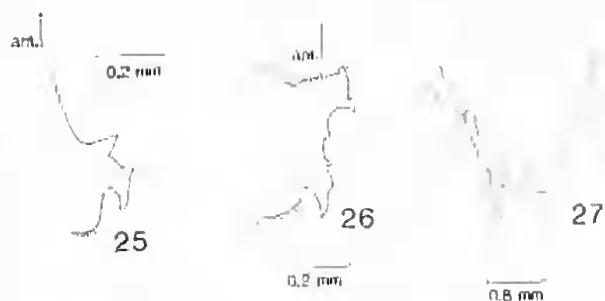
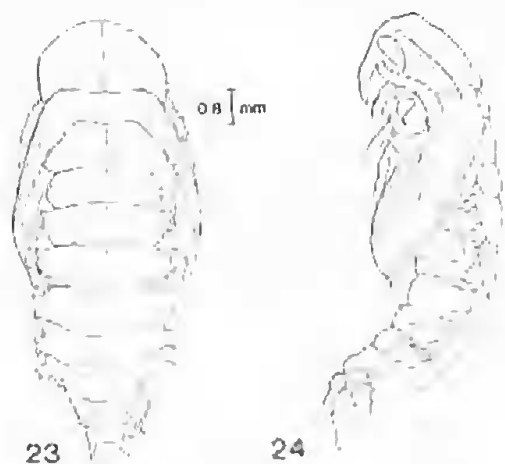
FIGURES 15–22. *Bassianus rectibasis*, larva. 15, left maxilla, ventral aspect. 16, hypopharynx, dorsal. 17, 18, prothoracic and mesothoracic legs, posterior aspect. 19, abdominal apex, lateral. 20, abdominal apex, dorsal. 21, 22, right mesothoracic and second abdominal spiracles. Crenulate margin is posterior.

Sexual dimorphism: Evident in shape of hind leg of male, with femur posteriorly concave in outline and bearing a small tooth or angle distally, trochanter usually dentate, and tibia sometimes apically bent. Male *R. sydneyanus* also have a short tomentose line on inner edges of all femora, and fore tibia apically bent.

Description of late instar larva (based on rectibasis)

General appearance: Body subcylindrical, moderately sclerotized. Brownish. Total length 12–14 mm.

Head: Slightly flattened, deflexed at rest, with mouthparts directed anteroventrally. Cranium medium brown, coarsely punctate. Epicranial stem length about 0.15 times head width; frontal arms very briefly bifurcate at apex, not reaching frontoclypeal suture (Fig. 10), endocarina absent. Lateral ocelli consisting of three pigment spots arranged in vertical row just behind antennal articulation and single spot (or two poorly separated spots) posterodorsal to row of three; cuticle colorless above eyespots, but not modified as lens. Cranial setae consisting of one pair at corners of clypeus, one pair just behind clypeofrontal suture,

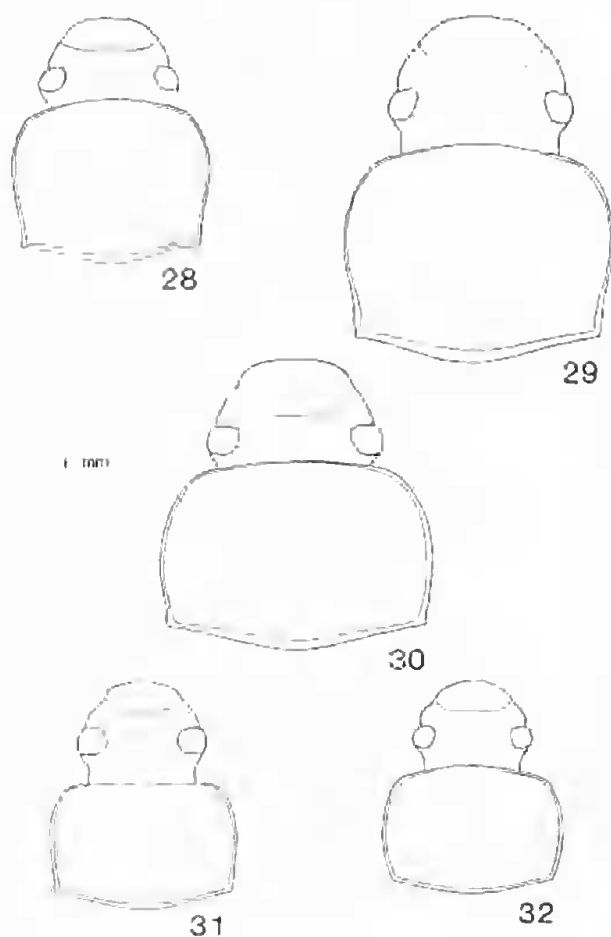


FIGURES 23–27. *Bassianus sydneyanus*, pupa. 23, dorsal aspect of pupa. 24, lateral aspect of pupa. 25, 26, right lateral lamellae (gln traps) of abdominal segment I and II. 27, abdominal apex, ventral.

two dorsal pairs, lateroventral patches of about 7–8 setae on each side and line of about five setae between eye spots and antennal base (Figs 10, 11). Clypeus with posterior half rigidly sclerotized, pigmented; anterior half flexible, densely set with asperities. Gular sutures incomplete posteriorly; tentorial pits aligned horizontally (Fig. 11). Antenna three-segmented; articular membrane expansive, allowing partial antennal retraction, and set with minute asperities; antennal segment two slightly longer than first; sensorium broadly U-shaped, partially encircling base of peg-like third segment. Labrum about 1.5 times broader than long, bearing transverse row of about six setae across middle and apical fringe of about 10 setae (Fig. 10); tormal arms slender, almost straight; epipharynx with marginal row of eight bristles, two marginal peg-like setae, one pair of submarginal and four pairs of central, annular sensilla; single masticatory process on right, several smaller processes on left. Mandibles (Figs 13, 14) with apices bifid; retinaculum a low carina on right mandible; bidentate, prominent process on left, separated from incisor lobe by deep cleft; molar lobes prominently elevated, right concave, left with prominent anteroventral tooth and strong dorsal

ridge; ectal mandibular surfaces each with two setae. Maxilla (Figs 11, 15) with articulatory area elongate, clearly demarcated from cardo; mala with double row of spines on medial surface, scattered liner, shorter setae on ectal surface. Labium with prementum trapezoidal, slightly broader than long, bearing seta at base of each palp, six setae dorsally and apically on ligula (Figs 11, 16); mentum irregularly hexagonal, about as long as wide; submentum not distinct from gula; hypopharyngeal sclerome with four-lobed anterior margin, dorsal surface very weakly concave.

Thorax: With pronotum about twice as long as mesonotum, anterior sixth of prothorax slightly constricted, longitudinally striolate dorsally, becoming finely granulose ventrally and continuous with sternite; posterior eighth of tergite forming finely granulose border; central portion of tergite coarsely, sparsely and shallowly punctate; laterotergite separated from tergite by carina, from sternal region by infolding, but continuous with anterior marginal region, finely granulose; sternite finely granulose, strongly involuted in anterior third,



FIGURES 28–32. Dorsal outlines of head and pronotum of *Kaszabu*. 28, *K. coerulea*. 29, *K. corvina*. 30, *K. laeta*. 31, *K. pulchra*, Queensland form. 32, *K. pulchra*, Northern Territory form.

forming subvertical surface against which deflexed head rests. Tergite with row of about eight long, slender setae along lateral margin, few short setae on disc; laterotergite with about five setae in longitudinal row; sternite with pair of anterolateral setae and one pair centrally. Mesothorax and metathorax similar to prothorax, but tergite without anterior striolate border. Prothoracic leg slightly larger, legs otherwise similar (Figs 17, 18), coxa with row of setae along anterior and posterior borders of ectal surface; femur and tibia with few short setae on ectal surface; trochanter with two, femur with three and tibia with four short setae on ental surface, apical two on tibia stouter; claw with pair of ental setae.

Abdomen: Segments 1-7 similar to metathoracic, but tergites with one anterior and one posterior short seta on lateral margins; laterotergites with one short seta at anterior fifth, sternites with single anterior and two posterior setae near each lateral margin, except sternite one, which has band of about 20 setae along anterior margin. Segment 8 similar, but with 2 posterolateral setae and one seta more dorsally near posterior margin (Fig. 19). Tergite 9 very much larger than narrowly transverse sternite (Fig. 19); deeply bifid posteriorly and produced as slightly upcurved prongs, and bearing pairs of nonarticulated spur-like processes on each side (Figs 19, 20); short setae situated near each process and around apices of prongs; long, slender setae distributed ventrolaterally and laterally on tergite and across sternite. Pygopods not visible.

Spiracles: (Figs 21, 22) with posterior margins crenulate; mesothoracic elliptical with about eight distinct, deep crenulations; abdominals very broadly elliptical with three or four distinct crenulations.

Description of pupa (based on sydneyanus)

General appearance: uniformly pale brown. Without setae. Total length 9 mm.

Head: Bent posteroventrally, invisible from above (Figs 23, 24); antenna held below prothoracic and elytral margin, just above front legs; segments 5-10 distinguished by annuli of blunt, non-articulated tubercles, largest dorsally and on apical segments; segment 11 with tubercles over entire surface.

Pronotum: With few tubercles along lateral margins; hypomerion with tooth like process protruding between antenna and profemur. Elytra and hindwings held between meso- and metathoracic legs; elytra with nine striae.

Abdomen: Tergites 1-7 produced as large lateral lamellae; lamella on segment 1 (Fig. 25) with weak anterior and strong posterior tooth; those on segments 2-6 with strong anterior and posterior tooth; anterior margin minutely serrate; lateral and posterior margins finely, irregularly dentate. Lamella on segment 7 with anterior corner angulate,

then arcuately receding posteriorly, with two marginal teeth; segment 8 with margin moderately explanate but unarmed, Sternites 7 and 8 with few weak tubercles along posterior margins. Tergite 9 produced as attenuate posterior processes; sternite 9, as much shorter, blunter processes.

Remarks

The structure of the female genital apparatus (Fig. 4) places this genus unequivocally in the Tenebrionini. It is in many respects similar to *Tenebrio* Linnaeus but does not have the spinulose connecting membrane of the aedeagus which is the principal apomorphism of the latter. As in some *Tenebrio* it has internally open procoxal cavities, a plesiomorphous feature shared with Heleini and Cyphaleini, with which it also shares (in part) the plesiomorphous subcubital fleck on the wings, absent in *Tenebrio*. Most of the above characters are found in the other native Australian Tenebrionini: *Meneristes* Pascoe, *Sloanea* Carter, and *Asphalus* Pascoe. *Bassianus* may be distinguished from all of these by the combination of the absence of a longitudinal groove on the outer faces of the tibiae and smaller size, and from all but *Meneristes* by the presence of wings. Separation of Tenebrionini, Heleini and Cyphaleini is discussed in Doyen *et al.* (in press) and in papers in preparation by the authors.

From the superficially similar but unrelated coelometopline genera *Tetragonomenes* and *Kaszaba*, with which it has been confused, adult *Bassianus* may be distinguished most easily by the absence of complex antennal sensoria, advanced anterior pronotal angles, distally expanded prosternal process, and complete elytral epipleura.

Watt (1974) distinguished larval Heleini and Cyphaleini from other tribes of Tenebrioninae on the basis of spiracular structure: peritreme crenulate in Heleini and Cyphaleini, simply annular in other tribes. He also remarked that larvae of *Meneristes* and *Asphalus*, though usually placed in Tenebrionini, which the adults resemble, have crenulate spiracles. Larvae of *Bassianus* have the spiracular peritreme crenulate, but only on the posterior side, and in the abdominal spiracles only three or four crenulations are visible.

An additional feature which may differentiate many larval Heleini and Tenebrionini is the structure of abdominal segment nine. In Tenebrionini (*Tenebrio*, *Neatus* Leconte, *Alphitobius* Stephens, *Zaphobas* Blanchard) sternite 9 is about one quarter as long as the tergite, and large pygopods are usually extruded in preserved specimens. In Heleini, as noted by Allsopp (1979), the sternite is much smaller, usually about one eighth to one tenth as long as the tergite. In Heleini pygopods are very small and rarely visible

in preserved specimens. In these features Heleini more closely resemble Ulomini.

Larval Heleini we have examined have the gular sutures very faint in the posterior half and not reaching the occipital foramen. In *Tenebrio* and *Neatus* the sutures may be somewhat faint posteriorly, but extend to the foramen. In *Zophobas*, however, the sutures are reduced to the tentorial pits, as in *Bassianus*.

Other characteristics, such as the shape of the antennal sensorium, configuration of epipharyngeal sensory organs, or structure of tergite 9 (Doyen *et al.* in press), may prove to be of value for these larvae, but much more extensive comparisons are required.

The genus most similar to *Bassianus* in larval features is *Meneristes* (Watt 1974). They share the large urogomphi on tergite 9, as well as exceedingly similar mouthpart and leg structures. In *Bassianus*, in addition to the large urogomphi, there are five other pairs of non-articulated spurs on the dorsolateral to ventrolateral surfaces of the tergite. In *Meneristes* there are only two lateral pairs of spurs. In *Bassianus* the antennal sensorium is U-shaped, whereas in *Meneristes* it is three-lobed. The epipharynx of *Meneristes* bears a pair of stout, short spines behind the patch of annular sensoria; in *Bassianus* the spines are absent. Finally, in *Bassianus* the legs are slightly more slender, with a comb of three or four tibial setae; in *Meneristes* there are five or more tibial setae, at least in later instars.

The general pupal form and the shape of the gin traps of *Bassianus* are similar to those of *Meneristes*. However, in *Meneristes* the pupal antennae lack the annuli of tubercles present in *Bassianus*. Pupal antennae of Tenebrioninae are not known to be tuberculate. This feature has not yet been examined in enough Heleini or Cyphaleini to speculate on its uniqueness.

The species of *Bassianus* are distinct and readily separated on external morphological characters. Minor genitalic differences could be found in the relative shape of the aedeagus (Figs 6–9). In addition, *rectibasis* bears long setae on the parameres, which in the other species are only minutely setulose.

KEY TO THE SPECIES OF *BASSIANUS*

1. — Base of pronotum strongly sinuate, very shallow transverse basal depression often present on disc (Fig. 33), inflected portions wrinkled or smooth, shagreened, not pustulose; striae usually effaced near bases of elytra, margin of last abdominal sternite not grooved; with fore tibia abruptly curved and expanded apically and all femora with tomentose

line on inner faces. Total length 9–12 mm. Victoria, New South Wales, Queensland

-*sydneyanus* (Blackburn)
- Base of pronotum straight or nearly so without transverse depression, inflected portions pustulose; elytral striae, except 7 and 8, complete to bases; margin of last abdominal sternite deeply grooved, ♂ with hind femur more or less distorted, femora without tomentose lines.....2
- 2(1) — Underside of prothorax glabrous, prothorax often quadrate in outline (Fig. 34); total length 6–10 mm. South Australia, Tasmania, Victoria, New South Wales and Queensland.....
-*colydioides* (Erichson)
- Underside of prothorax, especially prosternal process, with long setae; prothorax narrowing anteriorly (Figs 35, 36).....3
- 3(2) — Prosternum pustulose, upper surfaces coarsely punctate and shagreened, matt; total length 12–13 mm. Tasmania
-*humilis* (Erichson)
- Prosternum punctate only; upper surfaces finely punctate, nitid; total length 8–11 mm. Northern New South Wales, Queensland.....
-*rectibasis* (Carter)

Bassianus sydneyanus (Blackburn), comb. nov.
(Figs 4, 6, 33)

Menephilus sydneyanus Blackburn 1893: 132;
Carter 1914: 53; Carter 1926: 146.

Type

Near Sydney, N.S.W. BMNH. A female on a card bearing the designation 'T 4515 Syd.', with labels saying '*Menephilus sydneyanus* Blackb.' and 'Blackburn Coll. 1910-236', is designated lectotype.

Distribution

Eastern Victoria, New South Wales east of the Great Dividing Range, south-eastern Queensland, with a few individuals collected as far north as Kuranda.

Material examined

One hundred and ninety-two specimens. Victoria: Beaconsfield; Brighton; Cann River; 5 km N Cann River; Hurstbridge; Macedon; Mt Dom Dom (?) 2,500'; Narracan; North Melbourne; 19 miles W of Tallangatta nr Koetong; Tyers River; Warragul. New South Wales: Acacia Creek; Barrington Tops *via* Salisbury; Bateman's Bay; Bellingen; Blue Mountains; Brooklana, Sydney; Carrai Plateau *via*

Kempsey; Chichester State Forest, Lagoon, Pinch Park; Comboyne, 9 km W of Coonabarabran, 533 m; Cooperook Creek nr Brooklana; 13 km W of Coramba; Dingo Tops, 57 km NW Wingham; Dorrigo; Forest Reefs; Gibraltar Range N.P.; Gloucester River (Barrington Tops); 30 km S Glen Innes; Illawarra; 4–8 km SW Lake Cathie; Lowden For. Park, 30 km NE Captain's Flat; Minamurra Falls via Kiana; Monga; Mt Kosciusko; Mt Royal Range, 17 km E Moonany Flat; Mt Wilson; Myall Lakes, Booloombayt.; 4 miles N of Nelligen; Poverty Point, 20 km SE of Tenterfield; Styx R., Wattle Flat Camp; Swan Lake; Tenterfield; Upper Hunter; Werrikembi N.P., Cobcroft Camp; Wollomombi Falls, Queensland; Bald Mt area via Emu Vale; Barron River Falls; Binna Burra N.P.; Bolderly Park, Cooyar; Bulburin S.F.; Bunya Mountains; 26 km W Goomburra; Joalah N.P., Tamborine Mt; Kroombit Tops, 65 km SW of Gladstone, 1 000–1 100m; Kuranda; 12 km N Kuranda; Lamington N.P., McPherson Range N.P.; Mt Spec; Mt Tamborine; National Park; 10 km NE of Queen Mary Falls; Springbrook; Stanthorpe; Undercliff. Under bark, rotten logs; fallen logs; open forest. All months of the year. AMSA, ANIC, EMUC, MVMA, QMBA, SAMA, UQBA.

One pupa and several larval exuviae reared from larvae collected in Gibraltar Range N.P., New South Wales 27.XII.1982.

***Bassianus colydioides* (Erichson), comb. nov.**
(Figs 2, 7, 34)

Tenebrio colydioides Erichson 1842: 175.

Menepphilus colydioides, Carter 1914: 52; Carter 1926: 146.

Menepphilus parvulus Macleay 1872: 285; Carter 1914: 53; Carter 1926: 146 (syn).

Menepphilus armstrongi Carter 1933: 171. New synonymy.

Types

Of *colydioides*: Van Diemen's Land. A series of four female cotypes in MNHB, of which the specimen bearing the handwritten label 'colydioides Er. Terr. V Diem. Schayer' and the number 45953 is hereby designated lectotype; the others labelled 'Hist. Coll. Nr. 45943 Terra van Diem. Schayer' are paralectotypes. Of *parvulus*: Two specimens in AMSA on an unmarked card, labelled *Menepphilus parvulus* McL. W. Gayndah in Macleay's hand, and bearing the number K34632. Both were apparently considered to be holotypes by McKeown (1948). It is therefore necessary to select one as lectotype and the one on the left, a male, is hereby designated. The one on the right, a female is designated allolectotype. Three other specimens from Gayndah

in the Macleay collection in ANIC, evidently from the type series, are designated paralectotypes. Of *armstrongi*: Holotype ♀, Nandewar Range, New South Wales, 6.XI.32, J. Armstrong, ANIC.

Distribution

South Australia (the South East and Kangaroo Island), Tasmania, Victoria, New South Wales along and east of the Great Dividing Range, south-eastern Queensland as far as Bundaberg, and Heron Island.

Remarks

M. armstrongi was distinguished from *colydioides* by Carter on features of puncturation, proportion and colour, but the type is a normal female *colydioides*.

Material examined

One hundred and forty-two specimens. South Australia: Lucindale; Wilson R., Kangaroo Island. Tasmania: Devonport; George Town; Hobart; King Island; Lakes; Launceston; Lefroy; Long Bay; Mt Wellington; National Park; River Isis; St Patrick's River; Tyenna; Wilmot; Wynyard. Victoria: Brighton; Hastings; Lake Corangamite; Lorne; Macedon; Moe; Nelson; Warburton; Warnambool; Warragul; Werribee; Yarra Junction. New South Wales: Blue Mountains; Congo, 8 km SE by E of Moruya; Forest Reefs; 30 km S Glen Innes; Hanging Rock; Maitland; Mt Canobolis, 3 500–4 500'; Mt Wilson; Mullaly; Muswellbrook; Oberon; Sydney; 6 km NE of Tenterfield; Wahroonga; Worrigeer nr Nowra. Queensland: Brisbane; Bundaberg; Cunningham's Gap; Dunwich; Eukey; Heron Island; Indooroopilly; Mt Glorious; River Heads, 14 km SW of Urangan; Stanthorpe; Toowoomba; Yarraman S.F. Logs, dry sclerophyll. All months of the year. AMSA, ANIC, EMUC, MVMA, QMBA, SAMA, UQBA.

***Bassianus humilis* (Erichson) comb. nov.**
(Figs 8, 35)

Tenebrio humilis Erichson 1842: 174.

Menepphilus humilis, Carter 1914: 53, Carter 1926: 146.

Type

Van Diemen's Land. Four female cotypes in MNHB, of which the specimen bearing the handwritten labels 'humilis Er.' and 'Terra van Diem. Schayer', and the number 45952, is hereby designated lectotype. The other three with recent labels 'Hist. Coll. Nr. 45952 Terra van Diem. Schayer' are paralectotypes.

Distribution

Tasmania.

Material examined

Three specimens. Tasmania: Brighton; Lakes; River Isis. Nov. SAMA.

Bassianus rectibasis (Carter) comb. nov.
(Figs 9, 36)

Menephilus rectibasis Carter 1914: 53, 70; Carter 1926: 146.

Type

Dorrigo, Cox. Two males on a card in MVMA. The smaller left hand one has the letter 'T' written below it on the card and is here designated lectotype (T-4093). The other specimen (T-4094) is designated paralectotype.

Distribution

North-eastern New South Wales and south-eastern Queensland, with an apparently separate population in the area of the Atherton Tableland.

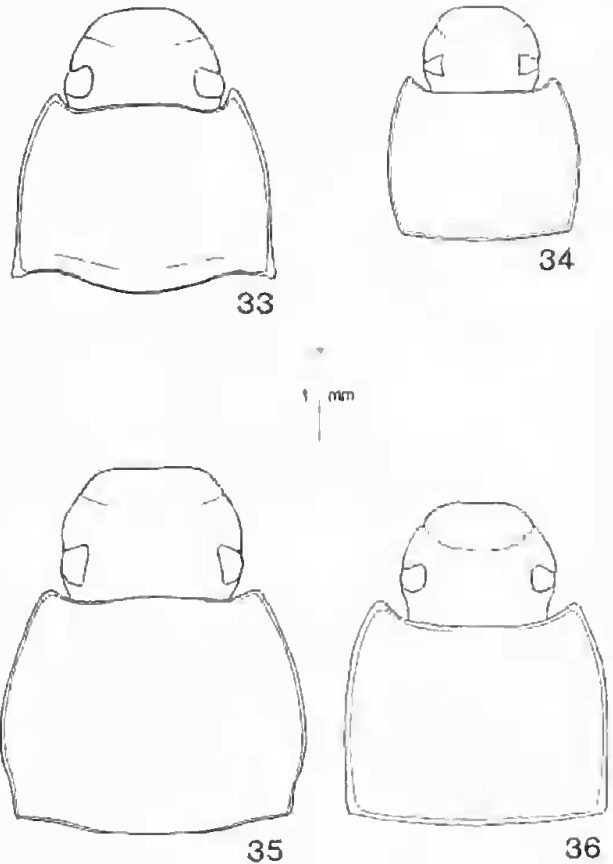
Material examined

Eighty specimens. New South Wales: Alstonville, Lumley Park; Barrington Tops, Allyn R. Forest; Cascade; Dorrigo; Dorrigo N.P.; Grafton; Lismore; New England N.P.; Richmond River; Tooloom Scrub via Woodenbong; Tooloom. Queensland: Brisbane; Bunya Mountains; Cairns District; Cooloola N.P. nr Poona Lake; Herberton; Joalah N.P., Tamborine; Lamington N.P., Malanda; Lever's Plateau via Rathdowney; Mt Glorious; Mt Tamborine; National Park; Ravenshoe. Rainforest. Apr.-Feb., mainly Sep.-Dec. AMSA, ANIC, EMUC, MVMA, QMBA, SAMA, UQBA.

Two mature larvae and several exuviae laboratory-reared from adults collected in New South Wales, Barrington Tops, Allyn River Forest, 9.XI.1982.

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FIGURES 33-36. Dorsal outlines of head and pronotum of *Bassianus*. 33, *B. sydneyanus*. 34, *B. colydioides*, 35, *B. humilis*. 36, *B. rectibasis*.

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